UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/578,389	11/28/2008	Michael Hobson	9792-97410	1890

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EXAMINER
CHU, RANDOLPH I

ART UNIT	PAPER NUMBER
2624	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

	Application No.	Applicant(s)
	10/578,389	HOBSON ET AL.
Office Action Summary	Examiner	Art Unit	
	RANDOLPH I. CHU	2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *28 November 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-23 and 30-32* is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-11,14-23 and 30-32* is/are rejected.

7)☒ Claim(s) *12-13* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☒ All b)☐ Some * c)☐ None of:

      1.☒ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☒ Information Disclosure Statement(s) (PTO/SB/08)
    Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____.

5)☐ Notice of Informal Patent Application

6)☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 101

1.   35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 30-32 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. Claims 17-24 are all directed to a distributed software agent. "Computer program" refers to software, which is functional descriptive material, which per se is nonstatutory. When functional descriptive material is recorded on some computer-readable medium, it becomes structurally and functionally interrelated to the medium and will be statutory in most cases. Please refer to "United States Patent and Trademark Office OG Notices: 22 November 2005" Annex IV for further guidance.

Claim Rejections - 35 USC § 102

2.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent

granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-4, 6, 8, 16-20, 22, 23, 30 and 31 are rejected under 35 U.S.C. 102(e) as being anticipated by Gallagher (US Patent 6,856,702).

With respect to claim 1, Gallagher teaches a) deriving a plurality of candidate mappings (Fig. 1 Image Processing Path 10_1-10_p) each candidate mapping defining a mapping between the signal domain of the digital input signal (Input image) and an alternative optimisation domain (output image), each signal in the signal domain corresponding to a set of optimisation parameters (Fig. 3 ref labels 42, 44, 46, 48 and 52) optimisation domain;

b) for each candidate mapping, calculating an indicator of the quality (noise matric) of the candidate mapping and generating a set of optimisation parameters in the optimisation domain of the candidate mapping, the set of optimisation parameters representing an enhanced signal in that domain (col. 8 line 43 – col. 9 line 50);

c) selecting the highest-quality mapping in dependence on the calculated indicators (col. 8 line 43 – col. 9 line 50) ;

d) selecting the set of optimisation parameters generated for the selected mapping in step b); (Fig. 1, path selector 32) and

e) applying the selected mapping to the selected set of optimisation parameters to produce an enhanced digital signal in the signal domain (Fig. 1, path applicator 6).

With respect to claim 2, Gallagher teaches that calculation of the quality indicator

is dependent on the generation of the set of optimisation parameters representing an

enhanced signal (col. 5 lines 10-20, the output noise metric is a function of the input

noise table and the image processing path 10).

With respect to claim 3, Gallagher teaches that generating a set of optimisation

parameters representing an enhanced signal in the optimisation domain of a given

candidate mapping comprises performing a search through the space of possible sets

of optimisation parameters in that domain (col. 7 lines 26-40, automatic exposure

determination algorithm).

With respect to claim 4, Gallagher teaches that performing a search comprises

optimising the set of optimisation parameters with respect to a quality measure

indicating the quality of an enhanced signal represented by any given set of optimisation

parameters (col. 7 lines 26-40, exposure, tone and contrast is modified to preferred

level).

With respect to claim 6, Gallagher teaches that the search is performed in

accordance with a numerical optimisation algorithm (col. 7 lines 26-40, exposure, tone

and contrast modification should be done by numerically).

With respect to claim 8, Gallagher teaches generating a set of optimisation parameters representing an enhanced signal comprises calculating at least an estimate of the set of optimisation parameters having the highest probability of representing, in the optimisation domain of the candidate mapping, the true signal (col. 8 line 43 – col. 9 line 50, average quality is maximized) ;

With respect to claim 16, Gallagher teaches the candidate mappings are defined by a continuously parameterisable mapping function (col. 7 lines 63 – col. 8 line 24).

With respect to claim 17, Gallagher teaches the mapping is selected in dynamic dependence on the signal (col. 7 lines 63 – col. 8 line 24).

With respect to claim 18, Gallagher teaches that the digital input signal is an image or a portion of an image, and wherein the mapping is selected in dependence on the image or the portion (col. 7 lines 63 – col. 8 line 24).

With respect to claim 19, Gallagher teaches that the candidate mappings are general non-linear functions (col. 7 lines 63 – col. 8 line 24, Human visual system modeler).

With respect to claim 20, Gallagher teaches that the candidate mappings are linear functions (col. 7 lines 63 – col. 8 line 24, imaging device response linearizer).

With respect to claim 22, Gallagher teaches that wherein the signal processing or enhancement operation is selected from the group consisting of sharpening; noise reduction; tone scale adjustment; intensity balance adjustment; colour balance adjustment; colour re-mapping; de-blocking; and image magnification employing interpolation (col. 7 lines 63 – col. 8 line 24, Balance applicator).

With respect to claim 23, Gallagher teaches means for selecting a mapping between the signal domain of the digital input signal and an alternative optimisation domain in dependence on the digital input signal (Fig. 1, path selector 32);

means for deriving an alternative signal representation from the digital input signal using the selected mapping (Fig. 1 Image Processing Path 10_1-10_p);

and means for performing a signal processing operation on the alternative signal representation (Fig. 1, path applicator 6);

wherein the selecting means is adapted to select the mapping from a plurality of candidate mappings (Fig. 1 Image Processing Path 10_1-10_p) using a mapping quality function which provides an indication of the quality (noise matric) of a given candidate mapping (col. 8 line 43 – col. 9 line 50) ;

wherein the plurality of candidate mappings are defined by a continuously

parameterisable mapping function of a set of one or more mapping parameters (col. 7

lines 63 – col. 8 line 24);

and wherein the selecting means is adapted to select the mapping by optimising

the mapping quality function as a function of the mapping parameters (col. 8 line 43 –

col. 9 line 50) ;

with respect to claim 30, Gallagher teaches processing the digital input signal to

determine the optimal mapping between the signal parameters and a set of optimisation

parameters (col. 8 line 43 – col. 9 line 50);

and utilising said optimal mapping in the signal enhancement operation (col. 7

lines 63 – col. 8 line 24);

the optimal mapping being selected from a plurality of candidate mappings in

dependence on a measure of the quality of signal enhancement achievable by applying

the signal enhancement operation to the digital input signal using a given candidate

mapping (col. 7 lines 63 – col. 9 line 50).

with respect to claim 31, Gallagher teaches determining the quality measure

(noise matric) by evaluation of a mapping quality function of a set of mapping

parameters;

and obtaining an optimum mapping by optimisation of the mapping quality

function as a function of the mapping parameters (col. 8 line 43 – col. 9 line 50);

Claim Rejections - 35 USC § 103

3.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set
> forth in section 102 of this title, if the differences between the subject matter sought to be patented and
> the prior art are such that the subject matter as a whole would have been obvious at the time the
> invention was made to a person having ordinary skill in the art to which said subject matter pertains.
> Patentability shall not be negatived by the manner in which the invention was made.

Claims 5, 7, 9, 10, 11, 14, 15, 21and 32 are rejected under 35 USC 103(a) as

being unpatentable over Gallagher (US Patent 6,856,702) in view of Kamath et al.

(2003/0026493).

With respect to claim 5, Gallagher teaches all the limitations of claim 4 as applied

above from which claim 5 respectively depend.

Gallagher does not teach expressly that the quality measure comprises a

measure of the probability that a given set of optimisation parameters represents, in the

optimisation domain, the true signal.

Kamath et al. teach the quality measure comprises a measure of the probability

that a given set of optimisation parameters represents, in the optimisation domain, the

true signal (para [0103]-[0104], noise variance).

At the time of the invention it would have been obvious to a person of ordinary

skill in the art to use noise variance as one of noise metric in the method of Gallagher.

The suggestion/motivation for doing so would have been that the user can interactively explore the best noise metric for a given application.

Therefore, it would have been obvious to combine Kamath et al. with Gallagher to obtain the invention as specified in claim 5.

With respect to claim 7, Kamath et al. teach calculating an indicator of the quality of a candidate mapping comprises analysing a probability distribution of the probabilities that given sets of optimisation parameters in the optimisation domain of the candidate mapping represent the true signal (para [0103]-[0104], noise variance).

With respect to claim 9, Kamath et al. teach calculating a quality indicator comprises calculating a Bayesian evidence function (para [0103]-[0104]).

With respect to claim 10, Gallagher teaches selecting a mapping between the signal domain of the digital input signal and an alternative optimisation domain in dependence on the digital input signal (col. 8 line 43 – col. 9 line 50) ;

deriving an alternative signal representation from the digital input signal using the selected mapping (Fig. 1 Image Processing Path 10_1-10_p);

and performing a signal processing operation on the alternative signal representation (Fig. 1, path applicator 6);

and wherein the mapping is selected from a plurality of candidate mappings by evaluating quality (noise matric) which provides an indication of the quality of a given candidate mapping. (col. 8 line 43 – col. 9 line 50).

Gallagher does not teach expressly that a Bayesian evidence function which provides an indication of mapping.

Kamath et al. teach that a Bayesian evidence function which provides an indication of mapping (para [0103]-[0104]).

At the time of the invention it would have been obvious to a person of ordinary skill in the art to use noise variance as one of noise metric in the method of Gallagher.

The suggestion/motivation for doing so would have been that the user can interactively explore the best noise metric for a given application.

Therefore, it would have been obvious to combine Kamath et al. with Gallagher to obtain the invention as specified in claim 10.

With respect to claim 11, Kamath et al. teach the Bayesian evidence function at least estimates the Bayesian evidence of the digital input signal given a particular candidate mapping. (para [0103]-[0104]).

With respect to claim 14, Gallagher teaches the plurality of candidate mappings are defined by a set of one or more mapping parameters (col. 7 lines 63 – col. 8 line 24); and Kamath et al. teach mapping is selected by optimising the quality indicator or

the Bayesian evidence function as a function of the mapping parameters (para [0103]-[0104]).

With respect to claim 15, Gallagher the mapping parameters are discrete and act as labels for a set of pre-defined mappings (col. 7 lines 63 – col. 8 line 24);

With respect to claim 21, Kamath et al. teach optimisation parameters in the optimisation domain are selected from the group consisting of coefficients of sinusoidal functions; coefficients of wavelet functions; coefficients of Gaussian functions; coefficients of top-hat functions; coefficients of signal-to-noise eigenfunctions of the input signal; and coefficients of continuous parameterisable functions that vary continuously between two or more standard forms (para [0103]-[0104], wavelet).

With respect to claim 32, Kamath et al. teach the mapping quality function is a Bayesian evidence function (para [0103]-[0104]).

Allowable Subject Matter

4.   Claims 12-13 are objected to as being dependent upon a rejected base claim, but would be allowable of rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Randolph Chu whose telephone number is 571-270-1145. The examiner can normally be reached on Monday to Thursday from 7:30 am - 5 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vikkram Bali can be reached on 571-272-7415. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/RANDOLPH I CHU/

Primary Examiner, Art Unit 2624